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For confidential circulation to plant pathologists in Australia. PLEASE DO NOT ABSTRACT.

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CEREALS AND GRASSES.

HEAD BLIGHT AND FOOT ROT OF WHEAT:

During the past two seasons the occurrence, in North Western New South Wales, of wheat plants affected by a head blight and foot rot condition has been reported by Mr. J. A. O'Reilly, District Agronomist, Gunnedah. The condition was prevalent in the 1954-55 season but less apparent last season. Blighted heads are characteristically bleached and show a salmon pink discolouration at the edges of the glumes and at the base of the spikelets. The grain sample is pinched and greyish white to pink in colour. The foot rot phase of the disease is characterized both by a pinkish discolouration of the stem bases, which may extend as far as the second or third node, and by a brown root rot condition.

The causal fungus, a species of Fusarium, has recently been identified by Dr. W.L. Gordon as F. graminearum Schwabe, the imperfect stage of Gibberella zeae (Schw.) Petch (=G. saubinetii (Mont.) Sacc.) Although recorded previously in N.S.W. on oats, and well known in this State as the cause of a cob and root rot of maize, there appears to be no previous local record of the occurrence of this fungus as a pathogen of wheat. Its association with a crown and root rot of wheat in Queensland has recently been established (see next article).

In comparative tests F. graminearum proved more virulent as a seedling and pre-emergence blight pathogen of wheat than did F. culmorum, Curbularia ramosa, Helminthosporium sativum, Ophiobolus graminis or Rhizoctonia solani. Pathogenicity tests on other species of cereals are in progress.

- F.C. BUTLER.

Agricultural Research Institute,
WAGGA WAGGA.

CROWN AND ROOT ROT DISEASE OF WHEAT IN QUEENSLAND:

A Fusarium crown and root rot disease of wheat was first recorded in Queensland on the Darling Downs in October, 1951. While the disease may cause a pre-emergence rot and a seedling collapse, the most conspicuous symptom is a crown and root rotted plant with an empty head or a head containing small shrivelled grain at harvest time. The basal stem regions on infected plants are covered with a pink growth of fungal threads and spores. This growth is prominent on the first node and may be present also on the second and third nodes.

The disease has been present in varying intensities each season since 1951. Losses were most severe in 1955 particularly in the Jondaryan-Brookstead district where the disease was present in all crops and the incidence in individual crops was as high as 24%. The disease was more severe in the heavier soils and in low lying portions of plantings.

A culture of the associated organism was forwarded on request to Dr. F. C. Butler for comparison with Fusarium culmorum. When it was found to differ markedly from this species Dr. Butler arranged for isolates to be examined by Dr. W.L. Gordon, Winnipeg, who determined the species as F. Graminearum Schwabe. This is the conidial stage of Gibberella zeae (Schw.) Petch (= G. saubinetii (Mont.) Sacc.), a fungus of some importance in Queensland as the causal organism of "pink ear rot" or maize.

The disease has been recorded in Queensland on wheat, barley, canary seed, oats, and on a weed host, Phalaris paradoxa.

All of twenty wheat varieties artificially inoculated with the fungus were susceptible, but there appears to be a variation in degree of susceptibility. Gabo, Lawrence, Cailloux and Puglu were among the more resistant, while Puora, Puno, Puseas and Warput were among the more susceptible.

Department of Agriculture & Stock, - T. McKnight.

Toowoomba.

TURF DISEASES ON SYDNEY GOLF COURSES:

As reported by the writer (A.P.D.R. 7 : 4 : 41, 1955) the two main diseases on golf greens in Sydney are brown patch (Rhizoctonia solani) and dollar spot (Sclerotinia homoeocarpa).

Two statistically designed fungicide testing experiments were carried out in six Sydney golf courses during the 1955-56 summer.

In these experiments each plot of 1,000 square feet, except the standard treatment plot, was treated with the appropriate fungicide in 10 gallons of water applied by means of a watering can. The standard treatment was applied in 50 gallons of water and then watered in.

The grass in all cases was Agrostis tenuis and the incidence of both diseases was similar to that recorded during the 1954-55 summer. Counts of dollar spot lesions ranged from 0 - 3,000 per plot, while brown patch lesions ranged from 0 - 297. The brown patch lesions varied in diameter from two inches to thirty inches.

The results, assessed on counts of lesions, are indicated in the following table. Control was rated on a 0 - 10 basis; 0 indicating complete control of the disease and 10 indicating a spread of the disease with no apparent control.

Treatment	Application	Rate per 1,000 sq.ft.	Rating for disease control	
			Dollar spot	Brown patch
1. "Gibson Calo-Chlor" (1 :1) (standard treatment).	4 weekly	4 ozs.	2.9	4.3
2. Corrosive sublimate	3 weekly	1½ ozs.	3.8	- +
3. Corrosive sublimate alternated with Zineb	2 weekly	1½; 2 ozs.	3.8	4.6
4. Corrosive sublimate	4 weekly	1½ ozs.	5.2	7.6
5. "Gibson Calo-Chlor (1 : 1)	3 weekly	2 ozs.	6.0	- +
6. Corrosive sublimate	3 weekly	1 oz.	9.7	- +
7. "Clerit"	4 weekly	5 ozs.	10.0	7.0

Note: "Gibson Calo-Chlor" (1 : 1) contains 37½% of each of the mercury salts calomel and corrosive sublimate and 25% inert material.

"Clerit" contains 3% w/w ethoxy ethyl mercury chloride.

+ - Brown patch was not recorded on these plots.

The mercury treatments had a retarding effect on growth but no outward sign of injury was apparent.

The additive effect of calomel is clearly shown at the 4 weekly interval while it is obscure at the 3 weekly interval. (Compare treatments 1 and 4, and 2 and 5).

Corrosive sublimate appears to have a critical concentration with respect to fungicidal activity and additive effect of calomel for each time interval of application.

The following table relating to dollar spot control is of interest with respect of quantity and concentration of mercury per unit area (1,000 sq. ft.) over the 1955-56 summer season.

Mercury Salt	Quantity /1,00 sq.ft./season		Interval of application	Rating for Dollar spot contrd
	concent-ration.	weight		
Corrosive sublimate + Calomel (1 : 1)	1:2660 (50 Gal; x 6)	18 oz.	4 weekly	2.9
Corrosive sublimate	1:1100 (10 gal. x 8)	12 oz.	3 weekly	3.8
Corrosive sublimate	1:1100 (10 gal. x 6)	9 oz.	4 weekly	5.2
Corrosive sublimate + Calomel (1 : 1)	1:1100 (10 gal. x 8)	12 oz.	3 weekly	6.0
Corrosive sublimate	1:1600 (10 gal. x 8)	8 oz.	3 weekly	9.7

- D. REILLY.

Department of Technical Education.
Sydney.

FRUIT.

BOTRYTIS CINEREA - INFECTION OF YOUNG VINE LEAVES:

In October this year, about four weeks after bud burst, Botrytis cinerea was isolated from young leaves of Waltham vines growing in the Mid Murray area of Victoria.

At first the lesions consisted of small dark brown, roughly circular lesions which had a damp appearance. These areas rapidly spread until large sections of the leaves were convered. As the necrotic areas enlarged, they became covered with the grey mycelium and conidia of this fungus.

This outbreak is considered to be due to a combination of slight frost damage, favourable weather conditions, and a heavy spore load, following a severe attack of Botrytis during the previous harvest.

The disease is not causing serious damage as it has only attacked the oldest leaves which were injured by a frost just after bud burst.

- R.H. TAYLOR.

Department of Agriculture,

Melbourne.

ORNAMENTALS.

STOCK MOSAIC - SEED TRANSMISSION:

The following observations strongly suggest the seed transmission of stock mosaic virus. Though not conclusive, it is considered worthy of record.

Over a period of five years stocks were grown from seed saved from each preceding crop. Thousands of plants were grown in the same area each year. During the first year a few plants were affected with typical flower breaking symptoms. Transmission experiments proved the virus to be stock mosaic virus. Each succeeding year the number of mosaic affected plants increased, until in the fifth year about eighty precent of the plants were affected. Seed was obtained from this crop and about 300 seedlings were grown in pots in an insect-proof glass-house. However, light and temperature conditions were not favourable for flowering, so that 150 of these were planted in a garden plot in the open in March of this year. They were sprayed with a systemic insecticide at monthly intervals, and were kept under close observation for insects, especially aphids. No insect was observed on them at any time.

They all flowered this season, when 97 of the 148 plants showed the flower breaking symptoms. Stocks from seed of another source were also grown near these and none showed any flower breaking. The grower of the virus-affected stock discontinued saving his own seed he purchased a new lot of seed, and there was no virus-affected plant in the crop this season.

- N.H. WHITE.

Faculty of Agriculture,

University of Sydney.

MISCELLANEOUS NOTES.

GERMINATION OF RESTING SPORANGIA OF PHYSODERMA TRIFOLII (PASSER.) KARLING:

Germination of resting sporangia of Physoderma trifolii (causing wart disease of subterranean clover) has been induced regularly by allowing resting sporangia over six months old to remain in a very weak (approximately 1/500) solution of succinic acid in water, at room temperature. About 80% germination is obtained after soaking for a minimum of 10 weeks. A very low percentage of sporangia will germinate in water alone, after this time.

Host debris and abundant micro-organisms do not affect germination, but since Physoderma zoospores are engulfed by protozoa the sporangia should be separated from host tissue and surface sterilized by treating for 3 seconds in 1% silver nitrate, if a high zoospore population is required.

Dormant resting sporangia are hemispherical, and contain a refractive globule. Under the conditions described germination commences by fragmentation of the globule, so that the contents become homogeneous. The cytoplasm then separates into cubic bodies (approximately 8 in diameter). The opening through which these are extruded, within a delicate membrane, is formed by the irregular cracking of the non-swollen base of the sporangium. Cracking is found in some species of Physoderma, e.g. P. alfalfae, whilst others open by a distinct lid, e.g. P. maculare. The units of the contents of the sporangium are released and function as zoosporangia, each one producing a number of small, active zoospores. This is the first record of germination of resting sporangia of P. trifolii.

Infection of Mount Barker variety of subterranean clover occurred when inoculated with these zoospores. This was accomplished by wiring down the tops of the plants so that they were held under water lying on top of the water-logged soil. In fourteen days numerous warts containing Physoderma rhizomycelium and resting sporangia had developed along the immersed petioles.

- N.H WHITE and ANN GREGORY.

Faculty of Agriculture,

University of Sydney.

A POWDERY MILDEW ON NICOTIANA MEGALOSIPHON HEURCK. etMuell:

A powdery mildew has been observed growing in a Canberra greenhouse on a line of N. megalosiphon, the seed of which was collected at Yuleba in Queensland.

By dusting dry spores on the leaves of a number of species of Nicotiana and of local races within species, infection was induced in one other seed line of N. megalosphon (from Brigalow, Queensland); in a line of N. excelsior Black (from Woomera, South Australia); and in a cultivated line of N. suaveolens Lehm originally received from Mr. G.B. Brooks of Rockhamptom, Queensland under the name of N. australis in 1953.

Species and hybrids which were uninfected following inoculation with dry spores were.

Species.

N. acaulis Speg.

N. acuminata (Grah) Hook.

N. debneyi Domin. (2 seed lines)

N. exigua Wheeler (3 seed lines)

N. excelsior Black (7 seed lines)

N. bigelovii Wats.

N. fragrans Hook.

N. glauca Grah. (several seed lines from different localities).

N. glutinosa L.

N. goodspeedii Wheeler (5 seed lines)

N. gossei Domin (5 seed lines)

N. longiflora Cav.

N. maritima Wheeler (2 seed lines)

N. megalosiphon Heurck. et Muell (5 seed lines)

N. rotundifolia Lindl. (2 seed lines)

N. rustica L. (4 varieties)

N. suaveolens Lehm. (6 seed lines).

Species. (cont'd.)

N. sylvestris Speg. et. Comes.

N. tabacum L. (24 varieties)

N. velutina Wheeler.

an unidentified species (2 seed lines).

Hybrids.

N. tabacum x N. glauca

N. tabacum x N. megalosiphon

N. bigelovii x N. gossei

N. goodspeedii x N. tabacum

N. clevelandii x N. megalosiphon

Amphidiploids.

N. debneyi-glauca

N. debneyi-tabacum

N. goodspeedii-tabacum

N. bigelovii-gossei

N. excelsior-tabacum

As cultivated tobacco is virtually immune this disease is not likely to become of economic importance.

- D.C. WARK.

C.S.I.R.O.,

Canberra.

CONTROL OF BOTRYTIS CINEREA:

Outbreaks of Botrytis occurred in cyclamens, peppers, tuberous begonias and strawberries in Victorian glasshouses in in the winters of 1955 and 1956. In all cases, good control was obtained by dusting with 15% penta chlor nitro benzene. More than one application of dust was sometimes necessary where the disease recurred.

In one glasshouse cyclamens sprayed with zineb, Vancide and thiram were compared with others which were dusted with P.C.N.B. Only the latter gave satisfactory control. Best results are obtained if P.C.N.B. is used before the Botrytis outbreak occurs, but often control can be obtained by dusting after plants become infected.

- R.H. TAYLOR.

Department of Agriculture,

Melbourne.

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BURNLEY.
Victoria.

EELWORMS ASSOCIATED WITH MUSHROOM DISEASE:

Recently, a number of specimens of cultivated mushrooms, grown in ridge beds at Dundas, in the Sydney Metropolitan Area, were found to be affected with a disease which appeared identical with bacterial blotch (Pseudomonas tolaasi Paine). The diffuse browning of sections of the caps, which characterize this disease, although relatively superficial, results in a lowering of the market value of the mushroom. The incidence of this disease is favoured by the presence of free moisture on the mushroom cap.

In the specimens concerned, an association of eelworms with the affected areas of the caps was noted. These eelworms were identified by Mr. J.M. Fisher of the Waite Agriculture Research Institute as belonging to the genus Rhabditis. This genus is mentioned in U.S. literature as a carrier of the bacterial blotch organism. Once the eelworm becomes established in the beds control is not feasible. Pasteurization of the compost (140° F for 3-4 hours) before laying down the beds is necessary to eliminate the eelworm infestation. While complete pasteurization of compost may easily be achieved in indoor culture where, for example, live steam can be utilized if necessary, this may be more difficult to achieve in outdoor culture. Sterilization of casing soil is also essential.

This is the first occasion on which an association of any eelworm genus with blotching of mushroom caps has been noted in New South Wales.

- R.J. CONROY.

Department of Agriculture,

Sydney.